

# HIV and mortality in Oregon

## HIV mortality in Oregon, 1981–2017

Of 10,373 cumulative cases of HIV infection diagnosed in Oregon from 1981 to 2017, 4,329 (42 percent) had died by Dec. 31, 2017. The advent of antiretroviral medications in the mid-1990s dramatically improved treatment outcomes. The probability of surviving 10 years after diagnosis was 87% for people diagnosed with HIV in Oregon from 2008 to 2017. Over the last decade, an average of 243 people were diagnosed with HIV infection in Oregon each year, and an average of 96 people with HIV died each year in Oregon (Figure 1).

## Ten-year survival among HIV cases in Oregon

The Oregon Public Health Division examined mortality among people diagnosed with HIV in Oregon using survival analysis techniques. These tools estimate probability of survival for a selected time after diagnosis. We found that the probability of surviving 10 years after diagnosis among people with HIV in Oregon during 2008–2017 was 87 percent. We then examined survival by sex, race, foreign-born status, age group at diagnosis, severity of disease at diagnosis, chronic hepatitis B infection, chronic hepatitis C infection and likely mode of HIV infection acquisition.

Ten-year probability of survival was similar among Asians (91%), Hispanics (88%), Whites (86%), American Indian/Alaska Natives (82%), Native Hawaiian/Pacific Islanders (100%) and multiracial cases (90%). As expected, we found that the higher the age group at the time of HIV diagnosis, the lower the probability of surviving 10 years (Figure 2).

## HIV and mortality facts at a glance

- The number of deaths per year among people with HIV declined from 354 deaths during 1995 to 72 cases during 2017.
- Oregonians diagnosed with HIV infection during 2008–2017 had an 87% probability of surviving 10 years after diagnosis.
- The following groups had a lower probability of surviving 10 years after diagnosis than their comparison group:
  - » Blacks relative to White non-Hispanics
  - » People aged > 60 years vs. 50–59 year-olds, aged 50–59 vs. 40–49 year-olds, aged 40–49 vs. 39 year-olds, aged 30–39 vs. 18–29 year-olds
  - » People with CD4 counts <200 cells/mm<sup>3</sup> at diagnosis relative to people with higher CD4 counts at diagnosis
  - » People without a reported risk of transmission and people who acquired HIV via injection drug use (IDU) relative to people with other modes of transmission
  - » People with reported chronic hepatitis C infection relative to people without hepatitis.
- During 2008–2017, HIV disease remained the leading underlying cause of death (44 percent) among people with HIV. Cancer (16 percent of deaths) was the second most common underlying cause.

By location of residence, highest probability of 10-year survival was among persons who resided in Multnomah County (89%) compared to mixed urban/rural counties (86%) and more rural counties of Oregon (83%).

Severity of disease at diagnosis, as indicated by CD4 count, was strongly related to probability of survival (Figure 3). HIV cases whose first CD4 count following diagnosis was less than 50 cells/mm<sup>3</sup> had a lower probability of surviving 10 years (68%) than people with a CD4 count from 50 to 199 cells/mm<sup>3</sup> (80%). In turn, those with a CD4 count of at least 200 cells/mm<sup>3</sup> had a 95% probability of surviving 10 years. Those diagnosed with AIDS when first diagnosed with HIV infection had a lower probability of surviving 10 years (76%) compared to persons diagnosed with HIV who did not progress to AIDS within 12 months (94%).

We then examined probability of surviving 10 years by likely mode of transmission of HIV infection (Figure 4). We found that those who likely acquired HIV infection through injection drug use (IDU) had a much lower probability of surviving 10 years (83%) than men who acquired infection via sex with other men (90%), or men and women who presumably acquired infection by heterosexual contact (92%). Those with chronic hepatitis C co-infection had a lower probability of surviving 10 years (79%) than people without hepatitis C co-infection (88%). Similarly, people with chronic hepatitis B co-infection had a lower probability of surviving 10 years (78%) than people without chronic hepatitis B co-infection (87%).

**Table 1. Underlying cause of death among people reported with HIV infection who died in Oregon, 2008–2017**<sup>\*,†</sup>

Underlying cause of death	Total	Percent	Underlying cause of death	Total	Percent
HIV disease	416	44%	Parkinson disease	2	0%
Cancer	153	16%	Tuberculosis	1	0%
All other causes	92	10%	Nutritional deficiencies	1	0%
Heart disease	59	6%	Anemias	0	0%
Unintentional injury	58	6%	Meningitis	0	0%
Suicide	35	4%	Alzheimer disease	0	0%
Chronic lung disease	28	3%	Atherosclerosis	0	0%
Chronic liver disease	28	3%	Peptic ulcer	0	0%
Diabetes mellitus	18	2%	Congenital anomalies	0	0%
Pneumonia or influenza	13	1%	Pregnancy complications	0	0%
Cerebrovascular disease	12	1%	Perinatal complications	0	0%
Viral hepatitis	9	1%	Homicide	0	0%
Hypertension	6	1%	<b>Total</b>	<b>946</b>	<b>100%</b>
Benign neoplasm	5	1%			
Aspiration pneumonitis	4	0%			
Septicemia	3	0%			
Nephritis or nephrosis	3	0%			

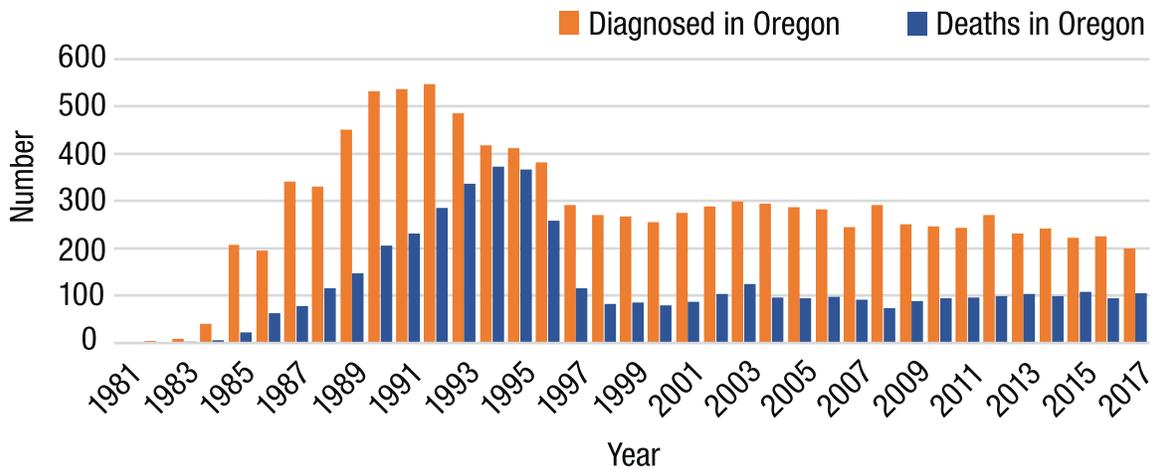
\* Only included deaths with HIV listed as the underlying cause or HIV listed among the other conditions reported at death.

† These deaths include people with HIV/AIDS who died in Oregon and may have been diagnosed with HIV/AIDS outside of Oregon.

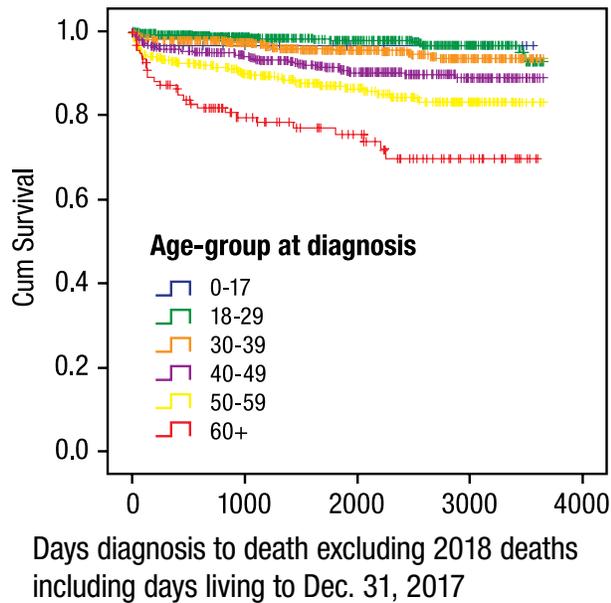
## Underlying cause of death among people with HIV/AIDS infection in Oregon, 2008–2017

Data from Oregon Vital Statistics on underlying causes of death among people with HIV who died in Oregon during 2008–2017 show that HIV disease was the underlying cause of death in 44% (416/946) of deaths among people with known HIV infection (Table 1). After HIV disease, cancer was the next most common underlying cause of death for 16% (153/946) of HIV cases who resided in Oregon. Among the 153 people who died from cancer, 33 percent (50/153) were reported to have died of lung cancer. Other leading underlying causes of death included heart disease, 6% (59/946); overdose, 6% (57/946); suicide, 4% (35/946); chronic lung disease, 3% (28/946); and chronic liver disease, 3% (28/946).

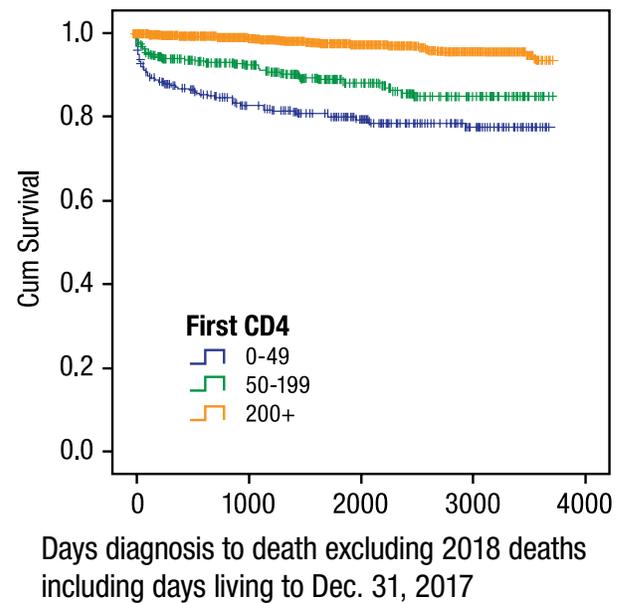
**Figure 1** HIV cases diagnosed in Oregon and HIV cases who have died in Oregon, 1981–2017



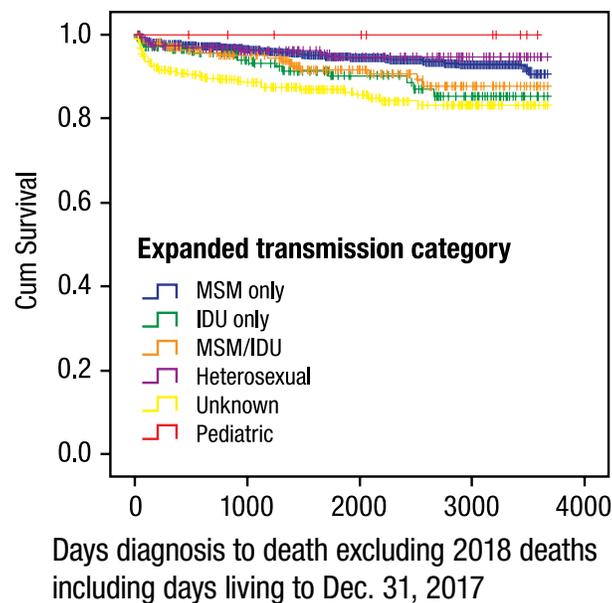
**Figure 2 Ten-year survival probability by age group**



**Figure 3 Ten-year survival probability by first CD4+ count following diagnosis\***



**Figure 4 Ten-year survival probability by likely mode of acquisition of HIV infection**



**Epidemiologic resources:**

Oregon Health Authority, HIV/AIDS epidemiology: <https://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/DiseaseSurveillanceData/HIVData/Pages/index.aspx>

Centers for Disease Control and Prevention: [www.cdc.gov/hiv](http://www.cdc.gov/hiv).

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